

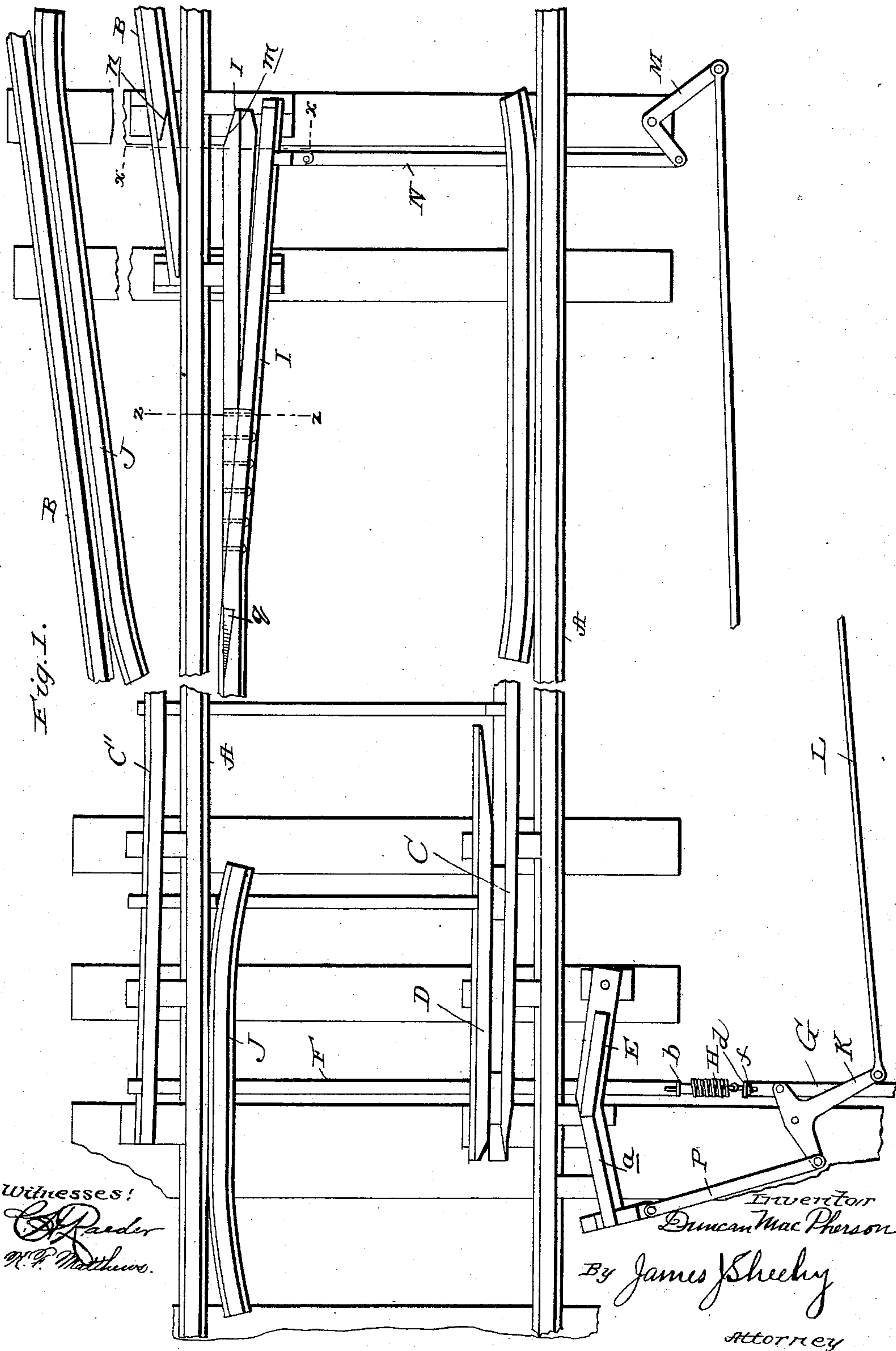
(No Model.)

3 Sheets—Sheet 1.

D. MACPHERSON.  
RAILWAY SWITCH.

No. 524,332.

Patented Aug. 14, 1894.



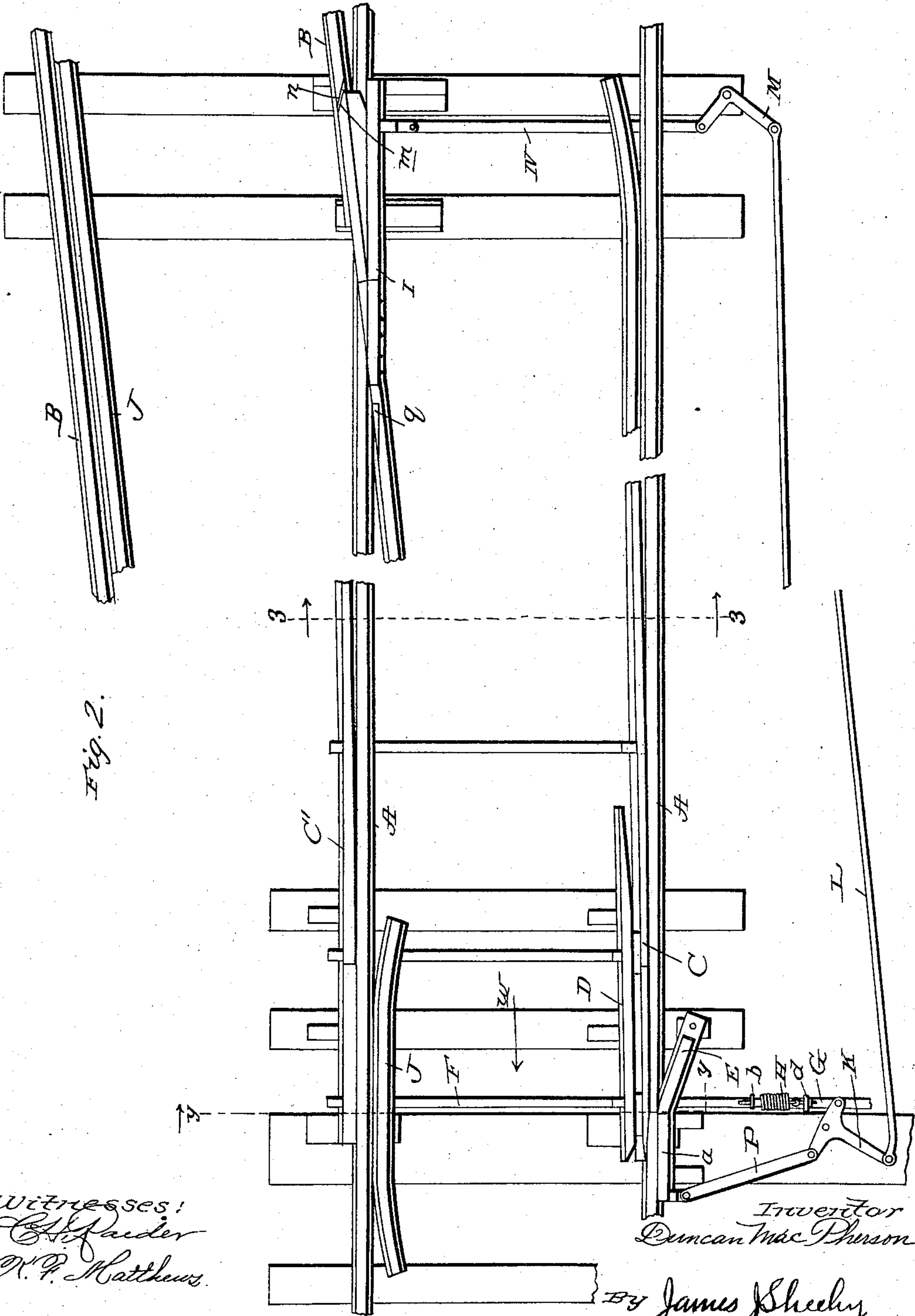
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3 Sheets—Sheet 3.

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Fig. 3.

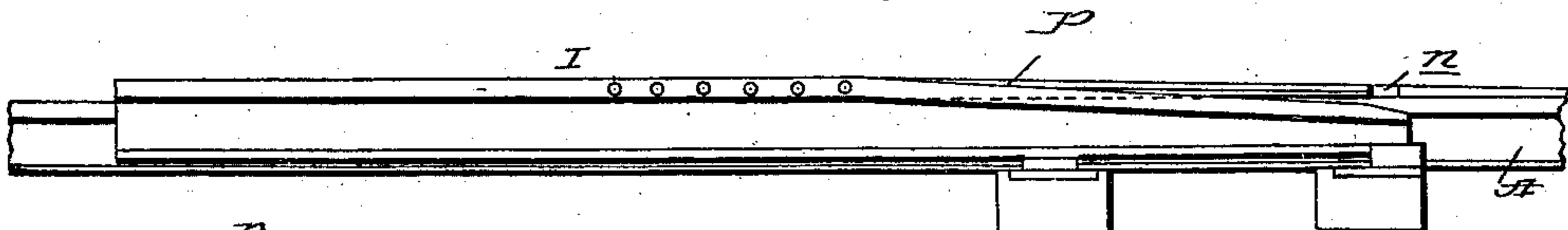


Fig. 4.

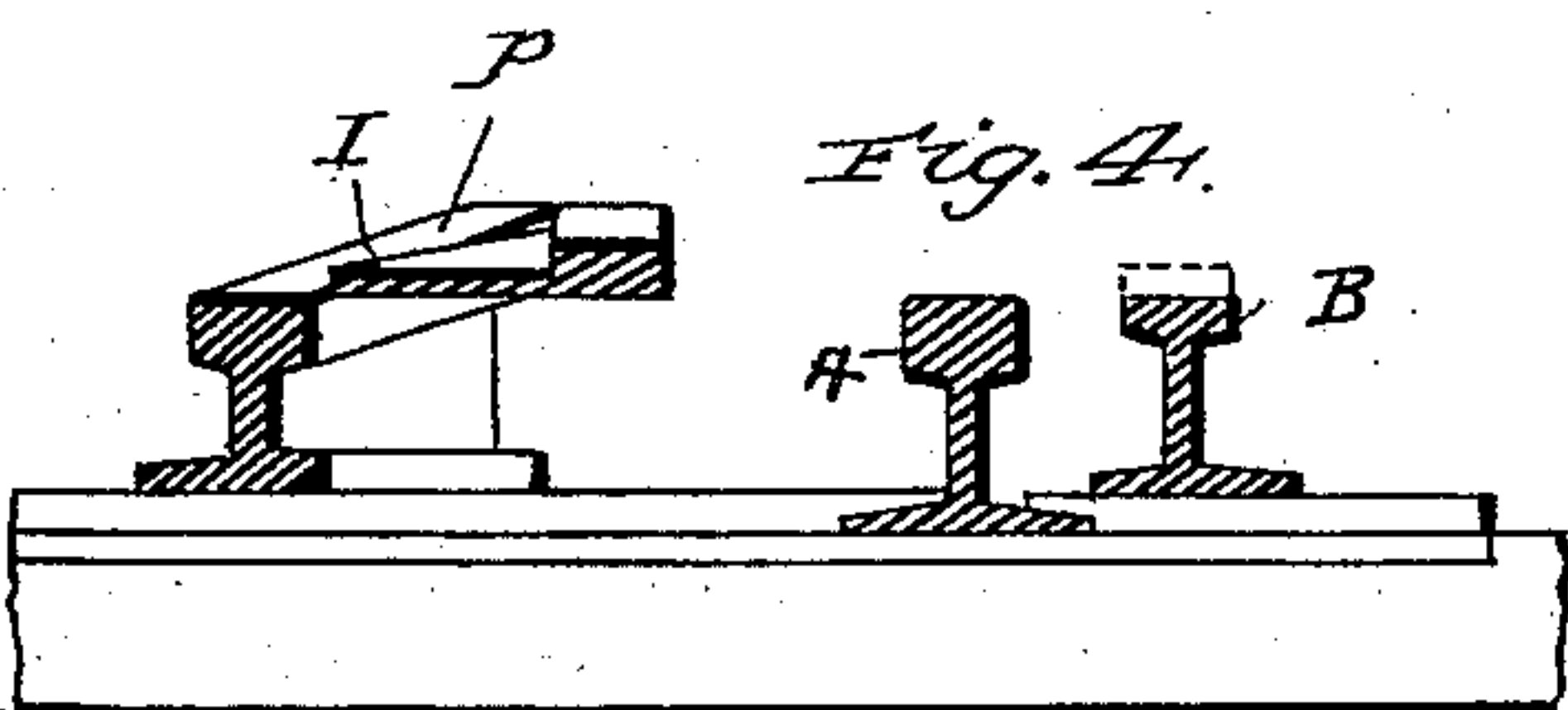


Fig. 5.

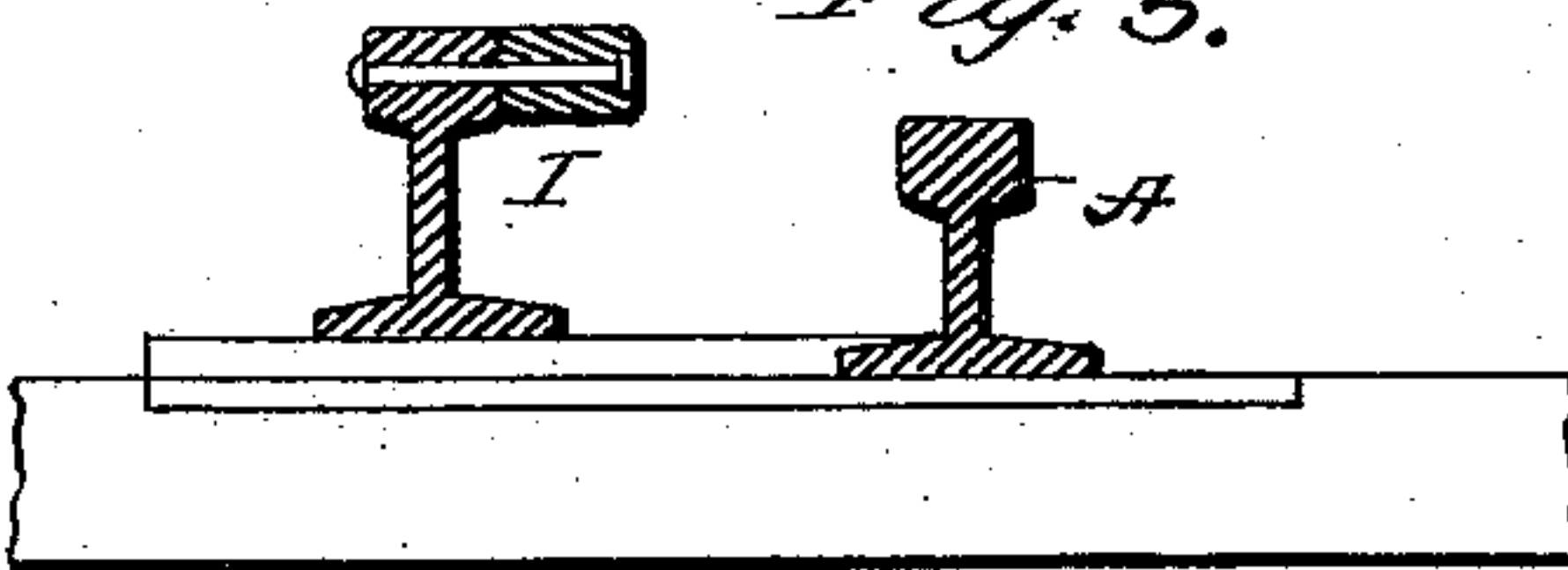


Fig. 6.

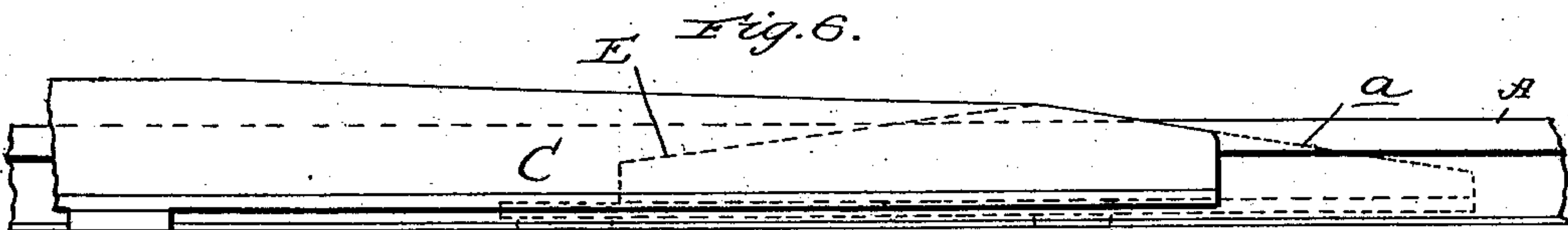


Fig. 7.

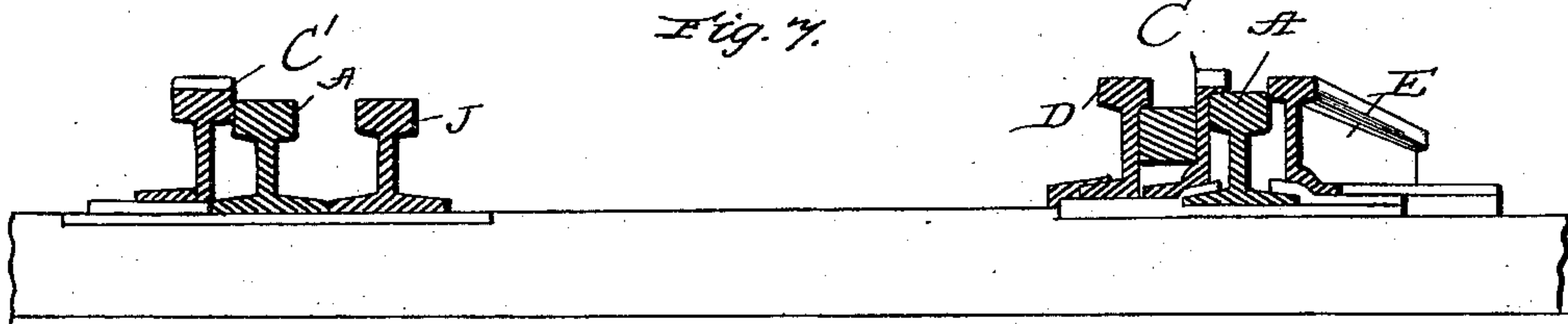


Fig. 8.

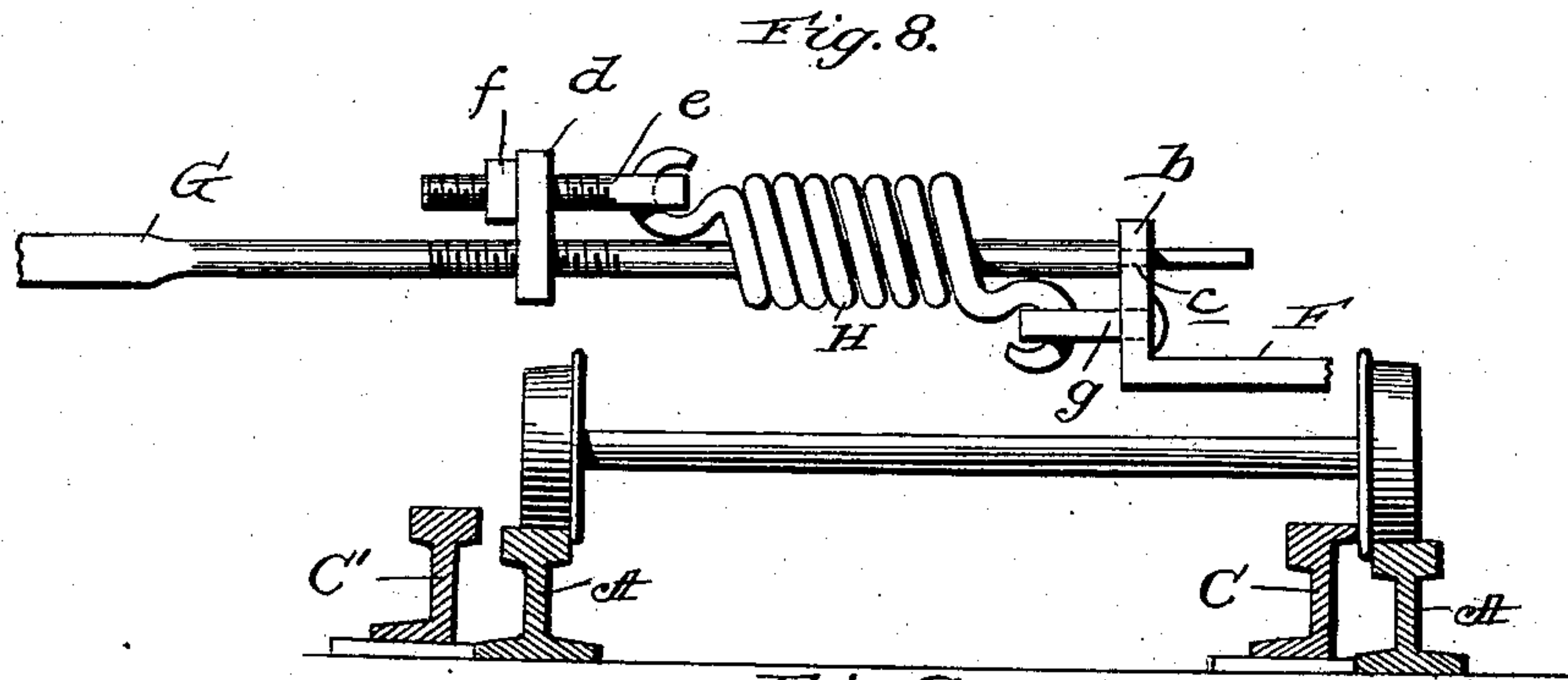


Fig. 9.

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Attorney



# UNITED STATES PATENT OFFICE.

DUNCAN MACPHERSON, OF MONTREAL, CANADA.

## RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 524,332, dated August 14, 1894.

Application filed May 10, 1893. Serial No. 473,680. (No model.) Patented in Canada June 20, 1893, No. 43,278.

*To all whom it may concern:*

Be it known that I, DUNCAN MACPHERSON, a subject of the Queen of Great Britain, residing at Montreal, in the county of Hochelaga and Province of Quebec, Canada, have invented certain new and useful Improvements in Railway-Switches or Track Turn-Outs, (for which a Canadian patent, No. 43,278, dated June 20, 1893, has been granted;) and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in railway switches or track turnouts, and it has for its general object to provide a switch or turnout embodying a construction that will permit a train to pass along the main track rails at a maximum speed over absolutely continuous and fixed rails without touching frog or switch rails; thereby removing all cause of damage to the switch points and materially prolonging the usefulness of same, and which will also permit a train to pass from the main track into a siding, or from the siding into the main track, without jolting, without danger of derailment and without unnecessarily wearing or damaging any of the rails.

In the accompanying drawings: Figure 1, is a broken plan view of my improved turnout with the switch rails and frog set for a clear main track. Fig. 2, is a similar view with the switch rails and frog set for a siding. Fig. 3, is a detail side elevation illustrating the frog, a portion of one of the main track rails and a portion of the inner turnout rail. Fig. 4, is an enlarged, detail transverse section taken in the plane indicated by the line *x, x*, of Fig. 1. Fig. 5, is a similar view taken in the plane indicated by the line *z, z*, of Fig. 1. Fig. 6, is an enlarged, detail side elevation, illustrating the pointed switch rail and a portion of one of the main track rails, together with the adjustable guard rail, which latter is illustrated in dotted lines. Fig. 7, is a transverse section taken in the plane indicated by the line *y, y*, of Fig. 2. Fig. 8, is a detail side elevation of the spring which connects the switch rod, and the connecting rod or link of the switch stand, and Fig. 9, is a transverse section taken in the plane indicated by the line 3, 3, of Fig. 2; car wheels be-

ing shown to illustrate how the wheels traveling upon the main line in the direction indicated by the arrow in Fig. 2, pass through the switch.

In the said drawings, similar letters designate corresponding parts throughout the several views, referring to which—

A, indicates the unbroken main track rails.

B, indicates the fixed turnout, or siding rails, and C, C', indicate the adjustable switch rails; the outer one C', of which has the inner portion of its flange removed, whereby it may be adjusted against the adjacent rail A, as shown in Figs. 2, and 7. This rail C', is of a greater height than the rails A, for a portion of its length and its upper surface is beveled at its toe end as shown in Fig. 7, whereby it will be seen that the flange, of a wheel traveling up the bevel surface or inclined plane, will be elevated so that its flange will be conducted across the main track rail.

The inner switch rail C, is connected and adapted to move with the rail C', and it is of a greater height than the main track rail and is designed to overhang or lap the same as shown in Fig. 7. This rail C, is also pointed and its upper surface is beveled at its forward end so that a wheel will readily take upon the same.

In order to guide and keep the wheels of a train upon the main track and switch rails in coming out of or going into a siding, I provide the guard rail D, which is arranged parallel to and is fixedly connected with the switch rail C, so as to move with said rail and the rail C'. This guard rail D, preferably has its side contiguous to the rail C, beveled at both ends, and it is designed more particularly to facilitate the passage of the car wheels from the switch rails to the main track rails, inasmuch as when the wheel tires happen to be worn, it serves to prevent them from clinging to the rail C', too long.

E, indicates an adjustable guard rail which is designed and adapted to protect the ball and point of the rail C, from unnecessary wear when a large number of trains pass from the main track rails into the siding. This rail E, is preferably of a general obtuse-angle form and it is pivotally connected at one end to a tie, so that its outer portion *a*, may be thrown against or from the main track



rail A, upon the outer side of which it is arranged, as shown.

The outer portion *a*, of the rail E, or that portion which is designed to rest against the main track rail, is inclined from its end to a point opposite the commencement of the bevel on the rail C', as shown by dotted lines in Fig. 6, so that a car wheel in passing from the main track rail upon the switch rail will at the same time pass upon the guard rail, and thus the point of said switch rail, will be protected or reinforced, as it were. The inner portion of the guard rail E, is also beveled, but in an opposite direction to the outer portion, as illustrated, whereby it will be seen that it will not be engaged by the worn flanges of wheels extending upon the outside of the main track rails, which would tend to push the guard rail away from the main track rail. F, indicates a switch rod which is connected with and is designed to impart movement to the switch rails C, C'; and G, indicates a rod or pitman which is connected to a switch operating mechanism of any approved construction.

The rod F, has an upwardly extending branch *b*, at its outer end (see Fig. 8), which is provided with a slot *c*, for the reception of the reduced inner end of the rod G, and the said rod G, is threaded as shown for the engagement of an adjustable plate *d*, which has an additional aperture to receive the threaded shank of the eye bolt *e*, which is secured and adjusted, when necessary, by the nut *f*. This eye bolt *e*, is engaged in practice by the coiled spring H, which surrounds the rod G, and has its opposite end connected to the bolt *g*, of the plate *c*. The spring H, is of sufficient strength to allow the switch rails to be readily adjusted through the medium of the rods F, and G, and yet is adapted to give sufficiently to allow the flanges of wheels traveling in the direction of the arrow in Fig. 2, to push the switch rail C away from the adjacent main track rail A, as shown in Fig. 9. Thus it will be seen that a train may travel on the main track in the direction indicated, while the switch is set for a siding, which is an important advantage as is obvious.

By reason of the peculiar manner described of mounting the spring H, it will be seen that not only is a strong and durable connection effected between the rods F, and G, but the tension of the spring may be readily regulated, which is highly desirable.

I, indicates the frog of my switch, which is pivotally connected to the heel of the rail C, in any approved manner, and is of a width at its free end sufficient to cover the main track and turnout rails. This frog I, is generally of a corresponding height to the end of the rail to which it is connected and it has its free end mitered as shown at *m*, to engage the mitered shoulder *n*, of the turnout rail B, upon which it is designed to rest flush as better

shown in Fig. 2. By thus abutting the frog and the rail B, it will be seen that wheels may pass from one to the other without the objectionable jolting, so often experienced. It will also be seen that when so abutted the contiguous ends of the frog and rail B, are not liable to be casually moved out of alignment by lateral pressure of the wheels when going into or out of the siding.

The frog I, is provided, as better illustrated in Fig. 3, with an incline *p*, which is designed, when the switch is set for a siding, to rest against the inside of the main track rail. This incline *p*, preferably extends beyond the end of the frog proper, as illustrated, whereby it will be seen that the wheels of a train traveling on the main track in the direction of the arrow *w*, in Fig. 2, will be enabled to take upon and pass over the frog; the guard rail J, in such case serving to keep the wheels in their proper gage line. The frog I, is further provided with an inclined depression or cavity *q*, on the side or face thereof adjacent to the main line rail and at a point where the gage lines intersect when the switch rails and frog are set to direct the wheels upon the siding or turnout rails. This inclined depression or cavity *q*, is provided in order to avoid the thrust and shock from the wheel flanges against the frog-connecting rod, and thereby obviate the sudden drop of the wheel flanges when passing over the frog toward the switch, on the main line, when, by mistake, the switch has been left closed or set for the turnout or siding, thus insuring greater safety. The frog I, is manipulated simultaneously with the switch rails C, C', through the medium of the connecting rod G, the double, bell crank lever K, the link L, the bell crank lever M, and the connecting rod N, and the guard rail E, is also manipulated from the rod G, through the medium of the bell crank lever K, and a link P.

By the special construction and arrangement hereinbefore described, it will be seen that a train may enter or pass out of the siding, and may pass through the switch when traveling in the direction of the arrow *w*, without inflicting any blows upon the rails or being jolted thereby. It will be further seen that my construction is very simple and durable, that it is easily operated, and that it embodies no parts that are liable to get out of order.

By reason of the peculiar construction of the frog I, it may be made of such a thickness at one end as to permit of forming it of cast steel, and it may also be formed from riveted steel rails, a steel forging, or other suitable material.

I have specifically described the construction and relative arrangement of the parts of my improved turnout in order to impart a full understanding of the same, but I do not desire to be confined to such specific con-



struction and arrangement as such changes may be made in the construction and minor details, as fairly fall within the scope of my invention.

5 Having described my invention, what I claim is—

1. In a railway switch or turnout, the combination with the fixed and unbroken main track rails, the turnout rails, the adjustable switch rail C', of a greater height than the main track rails, resting upon the outside of said rails and having its forward portion beveled or provided with an inclined plane and the switch rail C, connected and adapted to move with the rail C', and resting upon the inside of the main track rails, the said rail C, being of a greater height than the main track rails and having its toe end pointed and beveled or provided with an inclined plane; of the guard rail D, fixedly connected with and arranged parallel to the rail C; the said guard rail being adapted to move with the rail C, and facilitate and insure the passage of wheels from the main track rails to the siding rails and vice-versa, substantially as specified.

2. In a railway switch or turnout, the combination with main track rails, turnout or siding rails, an adjustable switch rail C', and the adjustable switch rail C, of a greater height than the main track rails and having its forward portion beveled or provided with an inclined plane; of an adjustable guard rail arranged upon the opposite side of the main track rail with respect to the rail C, and having an inclined plane corresponding to the inclined plane of said switch rail substantially as and for the purpose set forth.

3. In a railway switch or turnout, the combination with main track rails, turnout or siding rails, an adjustable switch rail C', and the adjustable switch rail C, of a greater height than the main track rails and having its forward portion beveled or provided with an inclined plane; of an adjustable guard rail arranged upon the opposite side of the main track rail with respect to the rail C, and having an inclined plane corresponding to the inclined plane of the said rail C, and also having a plane inclined oppositely to the

plane of the rail C, substantially as and for the purpose set forth.

4. In a railway switch or turnout, the combination with main track rails, turnout or siding rails, an adjustable switch rail C', and an adjustable switch rail C, of a greater height than the main track rails and having its forward portion beveled or provided with an inclined plane; of an adjustable guard rail of a general obtuse-angle form, arranged upon the opposite side of the main track rail with respect to the rail C, and having an inclined plane corresponding to the inclined plane of said rail C, substantially as and for the purpose set forth.

5. In a railway switch or turnout, the combination with the main track rails, the switch rails, the rod F, having a branch b, at its outer end, and the rod G, bearing loosely in said branch b; of a plate d, mounted on the rod G, a coiled spring also mounted on the rod G, and having one of its ends connected with the rod F, a threaded bolt connected to the opposite end of the coiled spring and taking through the plate d, and a nut mounted on said bolt, substantially as specified.

6. In a railway switch or turnout, the combination with the main track rails and the turnout rails; of the adjustable switch rails, an adjustable frog, an adjustable guard rail arranged upon the opposite side of the main track rails with respect to the adjacent switch rail, the connecting rod F, of the switch rails the connecting rod N, of the frog, the double bell crank lever having one of its branches connected to the rod F, a link connecting the other branch of said lever with the adjustable guard rail, a bell crank lever M, connected to the rod N, a link connecting the double bell crank lever and the lever M, and a suitable means for actuating the rod F, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

DUNCAN MACPHERSON.

Witnesses:

THOS. R. HENDERSON,  
FRANK TAYLOR.